

Patent claims

1. A protective device (11, 21) for the safety-related shutdown of an electrical unit having
 - a first input for the purpose of receiving a switch-off signal,
 - a second input for the purpose of receiving a switch-on signal in the form of a switch-on pulse (401), and
 - an output for the purpose of driving the electrical unit (14, 14', 24, 24'), characterized by a pulse processing device (41) for the purpose of setting the protective device (11, 21) to an activation state, in which it can be switched on when the switch-off signal is not applied, for a predetermined period of time from reception of the switch-on pulse.
2. The protective device as claimed in claim 1, the switch-on signal originating from an on pushbutton (33).
3. The protective device as claimed in claim 1 or 2, the switch-off signal originating from a latchable emergency-stop pushbutton (12, 12', 22, 22').
4. The protective device as claimed in one of the preceding claims, the electrical unit (14, 14', 24, 24') being an actuator and, in particular, a contactor.
5. The protective device as claimed in one of the preceding claims, the inputs and outputs having a plurality of channels.
6. The protective device as claimed in one of the preceding claims, it being possible for the falling edge or both edges of the switch-on pulse (401) to be evaluated by the pulse processing device (41) for the purpose of setting the protective device to the activation state.

7. The protective device as claimed in one of the preceding claims, the pulse processing device (41) having a timing element which provides an acknowledgment command

for the purpose of maintaining the activation state for a predetermined time after the switch-on pulse (401).

8. The protective device as claimed in one of the preceding claims, the predetermined period of time for the activation state corresponding at least to the activation time of the electrical unit (14, 14', 24, 24') and/or a further protective device.

9. A protective system having a plurality of protective devices (11, 21) connected in cascade fashion as claimed in one of the preceding claims, the first input of a second of the plurality of protective devices (21) being driven by the output of a first of the plurality of protective devices (11).

10. The protective system as claimed in claim 9, the inputs of the plurality of protective devices (11, 21) being connected to a common on pushbutton (33).

11. A method for safety-related switching of an electrical unit (14, 14', 24, 24') by means of

- receiving a switch-off signal,
 - switching the electrical unit (14, 14', 24, 24') off,
 - receiving a switch-on signal in the form of a switch-on pulse (401), and
 - switching the electrical unit (14, 14', 24, 24') on,
- characterized in that
- it is possible to switch the electrical unit (14, 14', 24, 24') on for a predetermined period of time after reception of the switch-on pulse (401).

12. The method as claimed in claim 11, the switch-on signal originating from an on pushbutton (33).

13. The method as claimed in claim 11 or 12, the switch-off signal originating from a latchable emergency-stop pushbutton (12, 12', 22, 22').

14. The method as claimed in one of claims 11 to 13, the electrical unit (14, 14', 24, 24') being an actuator and, in particular, a contactor.

15. The method as claimed in one of claims 11 to 14, the switch-on and switch-off signals being received on a plurality of channels.

16. The method as claimed in one of claims 11 to 15, the falling edge or both edges of the switch-on pulse (401) being evaluated in order to start the predetermined period of time in which the electrical unit (14, 14', 24, 24') can be switched on.

17. The method as claimed in one of claims 11 to 16, the predetermined period of time for switching on the electrical unit (14, 14', 24, 24') corresponding at least to the activation time of the electrical unit (14, 14', 24, 24') and/or a further protective device.

18. A method for safety-related switching of a plurality of protective devices (11, 21) connected in cascade fashion, a second of the plurality of protective devices (21) being connected with the aid of a first of the plurality of protective devices (11) in accordance with the method as claimed in one of claims 11 to 17.

19. The method as claimed in claim 18, the switch-on signal making all of the plurality of protective devices (11, 21) available simultaneously.